

IMPROVING THE MEDICAL ROBOTIC SURGICAL INTERFACE WITH SUBJECT TESTING

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Abstract

Robotic surgery technology has come a long way in the recent past and has been adopted into a wide range of applications. While there are many benefits to the use of robotic-assisted surgery, tasks typically take much longer to perform, relative to traditional manual methods. As a result, we used the Zeus surgical robot to perform a Fitts' aimed movement task with 10 subjects to determine the effect of task difficulty (ID) and control-display gain on movement time. The task was performed over three levels of difficulty with two different size boxes (large and small) for each level. As predicted by Fitts' law the movement time increased as task difficulty increased, however for two of the IDs there was a significant time gap between the large and small boxes ($p < 0.001$). This leads us to believe that display gain has a significant effect on movement time, while the control gain that we examined did not. We also identified several sources of error in this study and will incorporate the lessons learned into future studies.

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